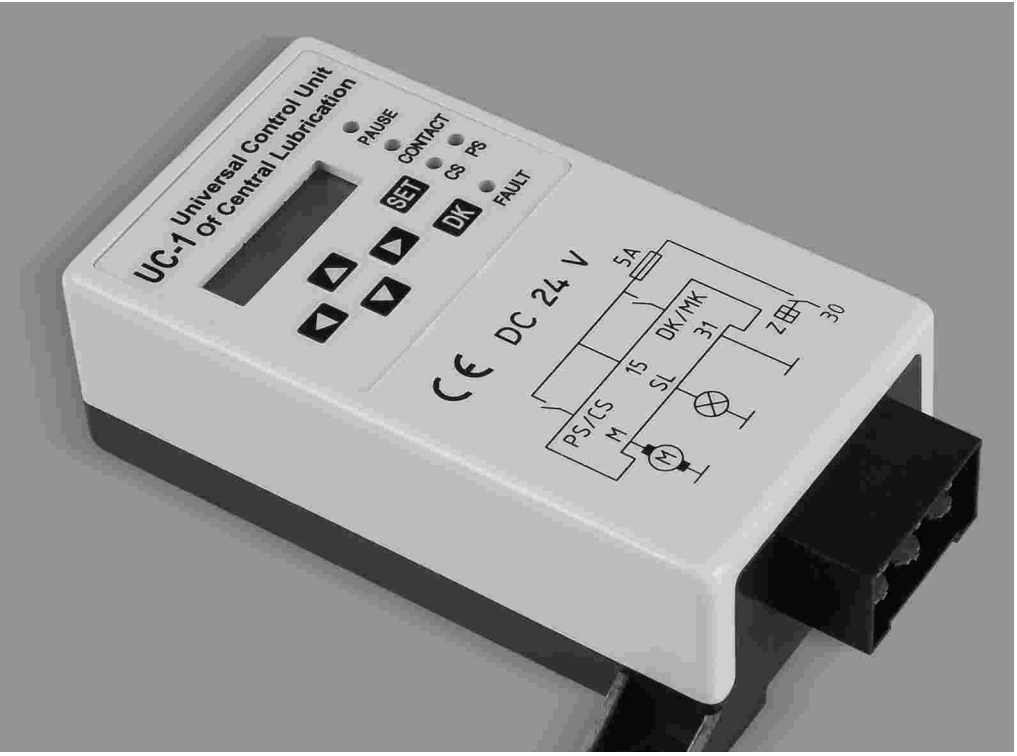
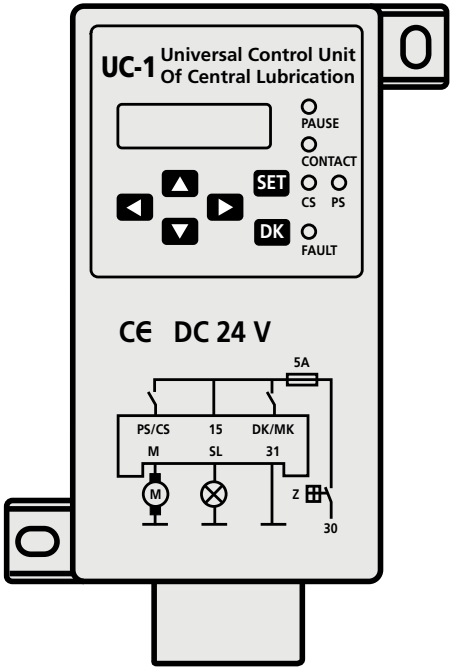
## Universal Control Unit UC-1-E

# User Manual

### General Information



## General Information

### Universal Control Unit UC-1-E

External Universal Control Unit UC-1-E is designed for controlling and monitoring of centralized lubrication systems of construction machinery, vehicles and machine lubrication. Universal Control Unit UC-1-E is compatible with Vogel IG502-E control unit.
UC-1-E stores configuration data and parameters in EEPROM, which makes UC-1-E store data safely for long period without backup power supply.
The control unit uses LCD display to show information.

### Factory Setting UC-1-E

| | | |
|---|---|---|
| Pause mode: | time | |
| Pause time: | 1 h | |
| Contact mode: | time | |
| Contact time: | 4 min (240 sec) | |
| Initial password: | 0000 | |
| System monitoring: | Pressure Switch | OFF |
| | Cycle Switch | OFF |

## Contents


| | | Page |
|---|---|---|
| **1.** | **Safety Warning Instructions!** | 2 |
| **2.** | **Installation** | 2 |
| 2.1 | Installation dimensions | 3 |
| 2.2 | Electrical connection | 4 |
| 2.3 | Cable harness, connector | 4 |
| **3.** | **Display and control panel** | 5 |
| 3.1 | LCD display | 5 |
| 3.2 | LED signal lights | 5 |
| 3.3 | Keys | 6 |
| 3.4 | SL signal lights | 6 |
| **4.** | **Display mode** | 7 |
| 4.1 | Display operation | 7/8 |
| **5.** | **Programming** | 8 |
| 5.1 | Start pogramming mode | 8 |
| 5.2 | Modify pause and/or contact parameters | 9 |
| 5.3 | Change system monitoring settings | 9/10 |
| 5.4 | Change pause and/or contact control modes | 10 |
| 5.5 | Change password | 11 |
| **6.** | **Operating modes** | 12 |
| 6.1 | Timer operation | 12 |
| 6.2 | Counter operation | 12 |
| 6.3 | Combination operation | 12 |
| 6.4 | Operation without system monitoring | 12 |
| 6.5 | Operation with system monitoring | 12 |
| 6.6 | Power-off protection function | 12 |

| | | Page |
|---|---|---|
| **7.** | **Faults** | 13 |
| 7.1 | Fault display | 13 |
| 7.2 | Fault message clearance | 13 |
| 7.3 | Block operation | 14 |
| | Block operation diagram | 14 |
| | No Signal from cycle switch | 15 |
| 7.4 | Block operation at display | 15 |
| 7.5 | Fault indication cycle switch at display | 15 |
| 7.6 | No signal from pressure switch | 16 |
| 7.7 | Fault message storage | 16 |
| **8.** | **Technical data** | 16 |
| **9.** | **Service address** | |

# 1. Safety instructions

### General information

Universal Control Unit UC-1-E is designed and manufactured not only in conformity with the general engineering standards, industrial safety and accident prevention regulations, but also in accordance with some relevant general industrial technical acceptance standards.
Although this unit complies with relevant safety technical requirements, the use of the unit may still entail dangers leading to personal injury of the user or third parties or damage to property. Therefore, the unit must be used when it is in correct technical condition. And the operation must strictly comply with operation manual. Errors that may affect safety must be rectified immediately.
Universal control unit UC-1-E may be used exlusively controlling and monitoring centralized lubrication systems. The user himself shall be liable for any damage caused by improper use.

### Potential electrical dangers

This unit must be connected to the power supply only by trained qualified personnel in accordance with the local electrical and technical regulations. Improper connection may lead to serious personal injury.
This unit is designed to use in battery-powered on-board electric systems of vehicles and engineering equipment. When it is used for any other purposes, all safety regulations should be complied with.

### Qualified personnel

Universal control unit UC-1-E may be installed, operated, maintained and repaired only by qualified personnel.
Qualified personnel means persons trained, assigned and instructed by the operator of the equipment concerned. These persons are familiar with the applicable norms, rules, accident prevention regulations and operating conditions on account of their training, experience and the instructions received. They are entitled to carry out the activities required in a given case and will be able to recognize and avoid possibly existing dangers. DIN VDE 0105 or IEC 364 contains the definitions for specialists and the prohibition to use unqalified personnel.

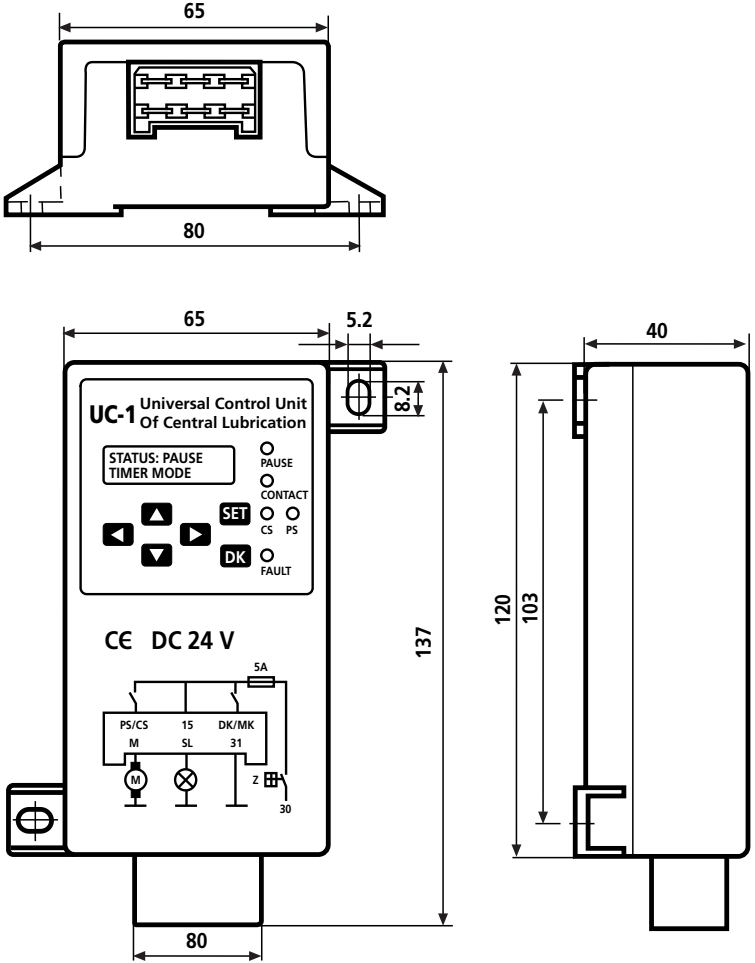
Exclusion of liability

- Occurred due to lack of lubricant
- Caused by soiled or improper lubricant
- Caused due to the installation of wrong components or spare parts
- Caused due to any use non-compliant with the intended purpose
- Due to faulty installation and filling
- Due to wrong electrical connection
- Due to wrong programming
- Due to improper reaction to failures

# 2. Installation

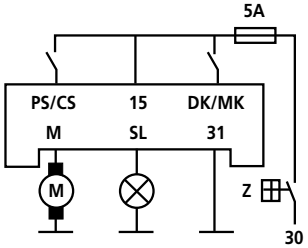
Universal Control Unit UC-1-E is designed to work in a closed compartment or machine cabin of vehicle to protect it from environmental influences.
If the control unit is installed at an inaccessible position, it is advisable to install additional signal lights and illuminated pushbutton on the dashboard. In that case the operating situation of the control unit can be monitored.

## 2.1 Installation dimensions

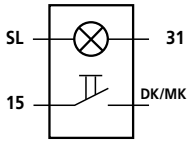


## 2.2 Electrical connection

| | |
|---|---|
| PS/CS | External Pressure Switch (PS) or Cycle Switch (CS) |
| 15 | Positive pole of power supply of UC-1-E |
| +M | Pump motor (positive) |
| +SL | External Signal Light (positive) |
| DK/MK | External pushbutton (timer operation) DK Counter signal input (counter operation) MK |
| 31 | Ground (minus) |
| Z | Ignition lock |
| 30 | Positive pole of power supply to ignition lock |
| F | 5A fuse (control unit protection) |




Terminal connection diagram




Electrical connection of external illuminated pushbutton diagram

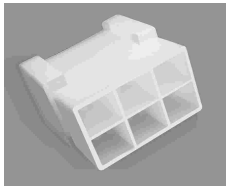
**Note:** Universal Control Unit UC-1-E has two models of 12V and 24V available. Please make sure that the system voltage of vehicle or machine matches the voltage claimed on the control unit.

When UC-1-E is operating, be sure the vehicle or machine system voltage is within power voltage limit range. Voltage that is lower or higher than the limit range will damage the control unit or causes functional problems.

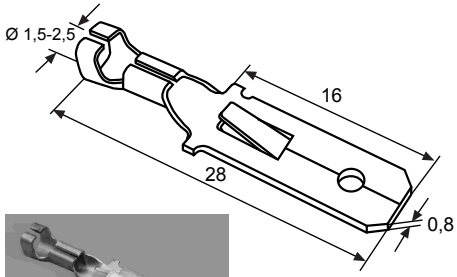
UC-1-E 24, voltage limit range
min 18VDC – max 36VDC
UC-1-E 12, voltage limit range
min 9VDC – max 18VDC
If the lowest required voltage is not guaranteed, please use a Low Voltage Protector to insure control unit function.

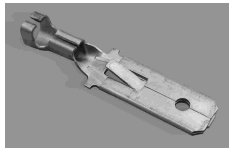
## 2.3 Cable Harness, Connector

Cable harness for external
Control Unit order no. GF200-005



Female Connector for six-blade terminals
order no. GF 200-015.K



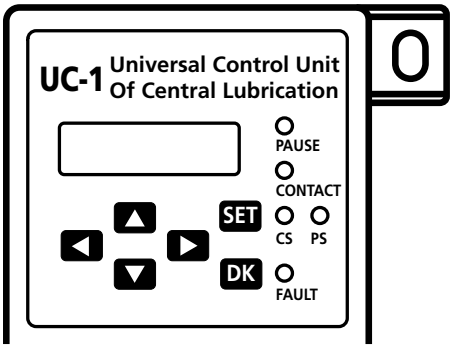



Blade Terminal 6,3-0,8/25
order no. GF 200-016.K

Material: Brass

## 3. Display and control panel

Film panel protects UC-1-E from humidity and dust. Please use soft cloth with warm water or neutral detergent to clean the film panel. Organic solvent is prohibited because the film is made of organic material. Do not use sharp tools/ objects to touch the panel.




### 3.1 LCD display

**STATUS: PAUSE**
**TIMER MODE**

LCD display shows operating status and parameters. It is deactivated normally.
To activate it, press key ▲ or ▼

### 3.2 LED signal light

**PAUSE** PAUSE:
Pause signal light.

LED “PAUSE” is on: Power is supplied to pump and control unit. System is in PAUSE time function.
LED “PAUSE” flashes:
1. Control unit is in PAUSE programming mode. The value and control mode of PAUSE can be changed.
2. When Cycle Switch monitoring is activated, LED “PAUSE” and “CS” will change to flash and indicates control unit is in PAUSE phase of a block operation.

**CONTACT** CONTACT:
Lubrication signal light

LED “CONTACT” is on: Power is supplied to pump and control unit. System is in CONTACT time function. (Pump motor gets power supply from UC-1-E)
LED “CONTACT” flashes:
1. Control unit is in CONTACT programming mode. The value and control mode of CONTACT can be changed.
2. When CS (Cycle Switch) monitoring is activated, LED “CONTACT” and “CS” will be change to flash and indicates control unit is in drive phase of a block operation.

**CS** CS. External cycle switch
signal light

LED “CS” is on: A Cycle Switch is used for monitoring the lubrication system.
Cycle switch will monitor the progressive distributor during pump running time.
LED “CS” flashes:
1. Control unit is in programming status for monitoring setting. At this status, the mode “Off Monitoring” can be altered; Cycle Switch monitoring can be activated or deactivated.
2. When CS (Cycle Switch) monitoring is activated, LED “CONTACT” (or “PAUSE”) and LED “CS” will change to flash and indicates control unit is in block operation.

**PS** PS: External pressure switch
signal light

LED “PS” is on: A pressure switch is used for monitoring the system. Monitoring of pressure during pump running time.
LED “PS” flashes:
Control unit is in programming status for monitoring setting. At this status, the mode “Off Monitoring” can be altered; the Pressure Switch monitoring can be activated (on) or deactivated (off).

**FAULT** FAULT:
Fault signal light

LED “FAULT” flashes quickly: Control unit indicates a system fault.
Press key ▲ or ▼, the fault message will be shown on LCD display.

### 3.3 Keys

▲
▼

Activate display in “Show” mode. Increase ▲ or decrease ▼ the displayed value at cursor position by “1” in programming mode.
Press key ▲ scroll left or right key to roll up the menu in menu operation.

◀ ▶

To move the cursor position when input parameters in programming mode

Press key ▲ for next menu step

SET SET

Activate programming mode. Confirm entered values or option.

DK DK

To initiate an intermediate lubrication cycle press “DK” once during PAUSE time operation.
In FAULT status, operate this key to clear fault message and get system back to normal lubrication cycle.

### 3.4 External Signal Light SL

If an external signal light SL has been installed, SL will flash for 3 sec after the ignition lock is started. This is for UC-1-E function control.
**Note:** Control unit needs a certain time to save the operating parameters after switching off supply (so that the lubrication tasks of the control unit could be continued after the break).

The interval of the power-off and next power-on should not be shorter than 3 sec. Otherwise, control unit may not start properly, and SL will not flash. (When the control unit is performing the lubrication tasks, Light “SL” will be on, denoting the state of lubrication; If the monitoring system finds a fault, light “SL” will be flashing, remind the user that there is a lubrication system function problem.

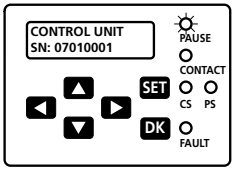
If control unit is in FAULT status you can activate system with DK to get it back to normal function within an intermediate lubrication cycle. Requirement is repair of malfunction. This is necessary to continue lubrication task after the break with current stored data. Denoting that lubrication system, pump is just working

# 4. Display mode

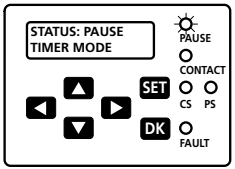
Briefly press key ▲ or ▼ to activate display. The current values and the preset parameters are shown. During normal operation, LED signal lights are used to show current status of the control unit.

## 4.1. Display operation

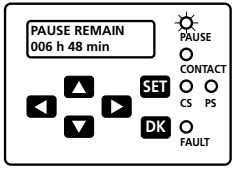
**1.** Press key ▲, display control unit´s Serial Number.
**Example:**: 07010001



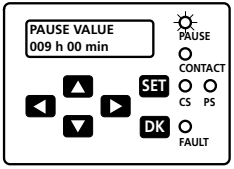

**2.** Briefly press key ▲ or ▼ to activate display mode and to show the current operating status of the control unit.
**Example**: PAUSE & TIMER MODE (Pause time in timer mode)



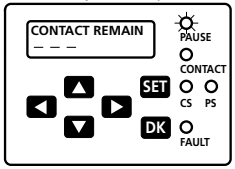

**3.** Press ▲, displays the remaining pause time.
**Example:** 006 h 48 min
(The remaining PAUSE time of the current lubrication cycle is 6 h and 48 min)



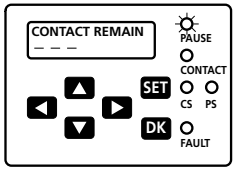

**4.** Press ▲, displays preset parameter of pause time.
**Example:** 009 h 00 min
(Preset total pause time is 9 h)



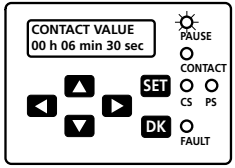

**5.** Press ▲, displays the control mode of CONTACT.
**Example:** TIMER (The control mode of pump is time operated)



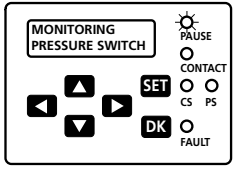

**6.** Press ▲, ”- - -” is shown.
Because system is now in PAUSE time function. There is no remaining value of CONTACT time.



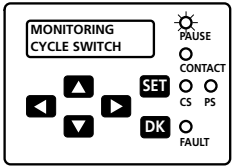

**7.** Press ▲, displays preset parameter of CONTACT.
**Example:** 00 h 06 min 30 sec
(Preset total lubrication time is 6 min and 30 sec)



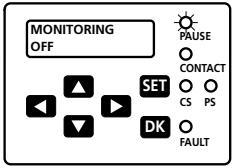

**8.** Press ▲, to display system monitoring.
Displayed content may be: PRESSURE SWITCH
(Monitoring with pressure switch)



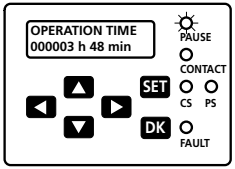
or CYCLE SWITCH
(Monitoring with cycle switch)



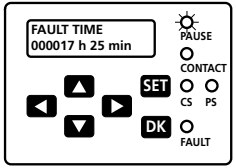

or OFF
(Monitoring disabled, no monitoring function)




**9.** Press ▲ Shows total UC-1-E hours.
Since installing control unit
**Example:** 000003 h 48 min
Maximum value: 9 9999 h 59 min




**10.** Press ▲ Shows total fault hours.
Since installing control unit
**Example:** 000017 h 25 min
Maximum value: 9 9999 h 59 min



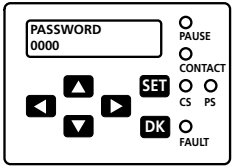

**11.** Press ▲ display will be switched off.
Total operation hours and total fault hours will not be erased.
They are permanently stored in EEPROM and can be indicated

## 5. Programming

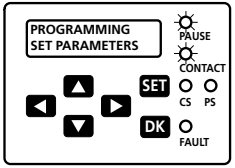
Press SET longer than 2 sec to activate programming mode. All preset parameters and control mode can be changed now.
**Please note:** Programming always starts with two steps.

### 5.1 Start programming

First step
**1.** Press SET longer than 2 sec, the control unit will then ask for password.
Please enter the preset password.

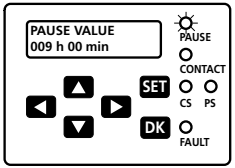



Second step
**2.** Press SET again to confirm password.
LCD now shows PROGRAMMING. And the default operation is “SET PARAMETERS”.

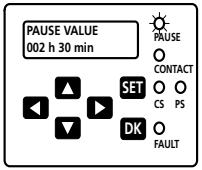


### 5.2 Change of pause and contact values
(Carry out steps **1-2)**

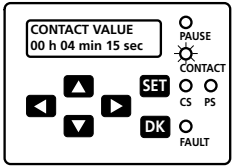
**3.** Briefly press SET to display the preset PAUSE value. LED “PAUSE” flashes.
**Example:** 1 h



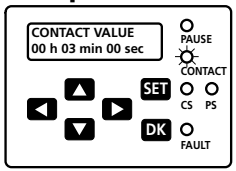

**4.** Use keys ▲, ▼, ◀, ▶ to change pause values.
**Example:** new value is 2 h 30 min




**5.** Press SET to confirm the new PAUSE value. LED “PAUSE” switches off and LED “CONTACT” Flashes. The preset contact value will be shown
**Example:** 4 min 15 sec




**6.** Use keys ▲, ▼, ◀, ▶ to set new contact value.
**Example:** new value is 3 min



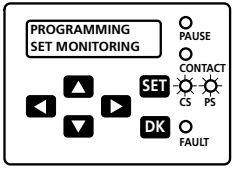

**7.** Press SET to confirm the new contact value.

**8.** LCD flashes to remind user all new values are confirmed. Then press SET a second time for more than 2 sec without releasing, LCD stops flashing; New values are saved permanently and display switches off.
**Note:** If pressing SET shorter than 2 sec, the control unit will give up new values and go back to the initial state of PROGRAMMING.

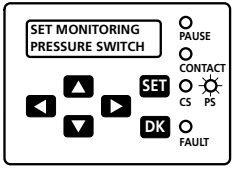
**!** To program new settings it is always necessary to press SET two times.
1. for confirming the new value
2. for storing the new value

### 5.3 Change system monitoring settings
Carry out steps **1-2)**

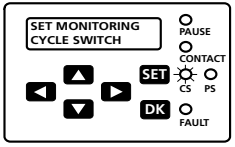
**3.** Press key ▲ till SET ”MONITORING” is shown on the second line of the LCD and LED “CS” or “PS” are flashing



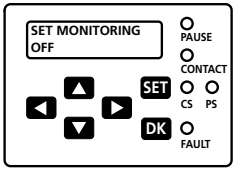

**4.** Briefly press SET to get into system monitoring setting status. The current monitoring mode is shown.
**Example:** ”PRESSURE SWITCH” Monitoring via pressure switch.




**5.** Press ▲, or ▼, to select monitoring mode.
**Example:** LED “CS” flashes, “CYCLE SWITCH” is selected. (Monitoring via cycle switch)



or select “OFF to deactivate system monitoring. (LED “CS” and “PS” switches off)



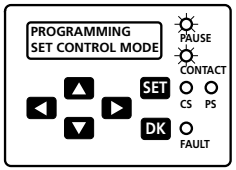

**6.** Press SET to confirm the new settings

**7.** LCD starts flashing to remind user that all new settings are confirmed.
Then press SET a second time for more than 2 second without releasing, LCD stops flashing; 2 second later, the new values are saved permanently and display switches off.
**Note:** If pressing SET shorter than 2 second, the control unit will give up new settings and go back to the initial state of “PROGRAMMING“.

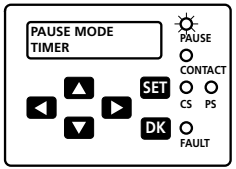
**!** To program new settings it is always necessary to press SET two times.
1. for confirming the new value
2. for storing the new value

### 5.4 Change pause and contact control mode (Carry out steps **1-2)**

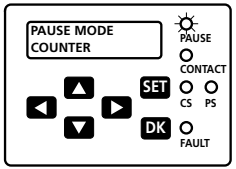
**3.** Press ▲ till “SET CONTROL MODE” is displayed on the second line of the LCD, and LED “PAUSE” and “CONTACT” flashing are together.



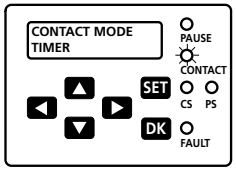

**4.** Briefly press SET to get into “PAUSE MODE“ setting.
LED “PAUSE” flashes.
The current pause mode will be shown
**Example:** “TIMER“ (factory setting)



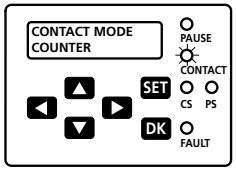

**5.** Press ▲ or ▼ to change “PAUSE MODE“.
**Example:** “COUNTER“




**6.** Press SET to confirm the new “PAUSE“ mode. LED “PAUSE” will switch off. “CONTACT” flashes. The preset “CONTACT MODE“ will be shown
**Example:** “TIMER“




**7.** Press ▲ or ▼ to change “CONTACT MODE“.
**Example:** “COUNTER“




**8.** Press SET to confirm the new “CONTACT MODE“.

**9.** LCD starts flashing to remind user that all new settings are confirmed. Then press SET a second time for more than 2 second without releasing, LCD stops flashing; 2 second later, the new values are saved permanently and display switches off.

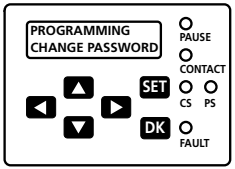
**Note:** If press SET shorter than 2 second, the control unit will give up new settings and go back to the initial state of “PROGRAMMING“.

**!** To program new settings it is always necessary to press SET two times.
1. for confirming the new value
2. for storing the new value

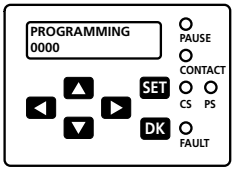
### 5.5 Change password
(Carry out steps **1-2**)

Once the password is changed, the password set by factory will be erased. The new password is saved till next change.

**3.** Press ▲ till “CHANGE PASSWORD” is shown on the second line of the LCD.

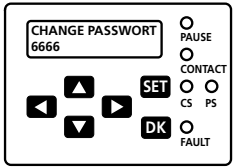



**4.** Briefly press SET to get into “CHANGE PASSWORD“ status.




**5.** Edit 4 digits new password.

**Example:** 6666
The password area of UC-1-E is 0000 To 9999. Control unit has no limitation within this area.




**6.** Press SET to confirm the new password.

**7.** LCD starts flashing to show user that new password is confirmed. Then press SET a second time, without releasing, LCD stops flashing. 2 second later, the new values are saved permanently and display switches off.
**Note:** If press SET less than 2 second, the control unit will give up new password and go back to the initial state of “PROGRAMMING“.

**Please note:**
The password should be kept in safe place. If the password gets lost, the programming of parameters for the control unit is impossible. In case of that, the control unit has to be sent back to the factory.

**!** To program new settings it is always necessary to press SET two times.
1. for confirming the new value
2. for storing the new value

# 6. Operating modes

### 6.1 Timer operation
Set “TIMER” for PAUSE and CONTACT.
The control of the lubrication cycle takes place based on the values preset for PAUSE and CONTACT times. It carries out the operation cycle of “PAUSE – CONTACT”: Within pressing DK, an intermediate lubrication cycle is activated or the displayed fault message is cleared. External DK button can be connected to the terminal DK/MK.

### 6.2 Counter operation
(Pause depends on impulses)
Set “COUNTER” for PAUSE and “TIMER” for CONTACT.
Connect an external impulse transmitter to the terminal DK/MK.
**PAUSE:** Display and program values in impulses.
**CONTACT:** Display and program values in minutes.

### 6.3 Combined operation
(Pump running is controlled by impulse)
**PAUSE:** Display and program values in impulse or time.
**CONTACT:** Display and program values in impulses.
**Users may combine**: “COUNTER MODE” of pause with “COUNTER MODE” of contact, or “TIMER MODE” of pause with “COUNTER MODE” of contact.

### 6.4 Operation without system monitoring
Lubrication cycle performs only according to the preset values of PAUSE and CONTACT time. Fault monitoring is disabled in this setting. Monitoring function must be disabled. Monitoring mode has to be “OFF”. Fault signal will not be detected and shown.

### 6.5 Operation with system monitoring
In this mode, system can be monitored by an external sensor.
The following functions can be monitored:
- Filling level in the lubricant tank (only for pumps filling level monitoring W1 or identical level monitoring function)
- Pressure build-up in the main line can be monitored via a pressure switch.
- Function of the progressive feeder can be monitored via a cycle switch (Blockade indication) Faults will be detected automatically and shown at LCD when system monitoring is activated.

### 6.6 Power-off protection function
The control UC-1-E has power-off protection function. When power is cut off, the control unit automatically remains operating status values, total operation hours and total fault hours at the point of power-off. When next ignition starts, the control unit will continue carrying out operation from last point of power-off. Control UC-1-E unit stores operating status and values in EEPROM. The data can reliable be stored for at least 10 years.

# 7. Faults

When the control unit detects system faults, LED “FAULT” on the panel will be flashing. If an external Signal Light is installed, light “SL” will also be flashing and reminding user that lubrication system is in fault function. Meanwhile, the control unit stops normal operation. The cause of the fault can be seen from the LCD.

### 7.1 Display faults

Briefly press ▲ or ▼ to start the display of fault messages. The meanings of the display are as followings.

**PRESSURE SWITCH:** No signal is received from pressure switch during pump running time.
**CYCLE SWITCH:** No signal is received from cycle switch during pump running time.
**LOW LEVEL ERROR:** The filling level in lubricant tank has dropped below the minimum level.
**SYSTEM ERROR:** Control unit itself has error inside. If such situation occurs, get the control unit power off. After 3 seconds switch power on. If error still exists, please contact the manufacturer.

### 7.2 Clear fault messages

Press DK to acknowledge and clear fault messages, and to start a normal lubrication cycle.
**Please note:** DK has to be pressed after determining and correcting the fault. The user himself is responsible for any damages caused by operating the machine/vehicle/equipment without correct lubrication.

### 7.3. Block operation

If CS (Cycle Switch) is programmed, a block operation will be activated automatically when no signal from the cycle switch is received during the pump running time. Follasing function will take place during block operation

(1). When no signal from CS is received during the programmed pump running period, the normal lubrication operation will be aborted. Then a 15 min interval block operation starts.

(2). When the first (15 min pause) block interval ends, UC-1-E starts driving the pump. If Signal from CS is received during that pump operation the block operation will be aborted. System goes back to normal lubrication cycle. If there is still no signal from CS, another second block operation starts.

(3). If signal from CS is received during second (15 min pause) interval, the block operation is aborted and the system will go back to normal operation. If there is no signal from CS, then the third block operation starts

(4). If the system receives signals from CS during the third (15 min pause) interval, then it will switch back to normal lubrication cycle. If there is still no signal received, then the block operation is aborted and a fault message will be shown a LCD Display.

If the preset PAUSE time is shorter than 15 min, the block pause will correspond to the preset value.

During block operation, relevant LED on the control panel will be flashing to indicate that the control unit is now performing block operation. LED “CS” flashes alternative with LED “PAUSE” means the control unit is now in the Pause phase of the block operation. LED “CS” flashes alternative with LED “CONTACT” indicates the control unit is now in Drive phase of the block operation.

## Block operation diagram

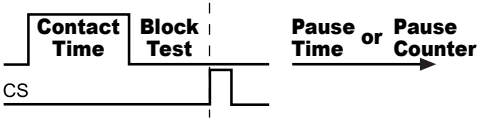
**!** When no signal from the cycle switch is received,the control unit responds by activating the block mode of operation.

**!** If the preset PAUSE time is shorter than 15 min, the block pause Block Test corresponds to this value.

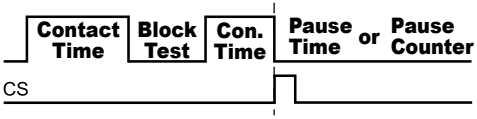
### Delayed signal from cycle switch

No signal from cycle switch during pump running time ⟶ **normal operation is aborted** 15 min block interval begins with inquiry of cycle switch

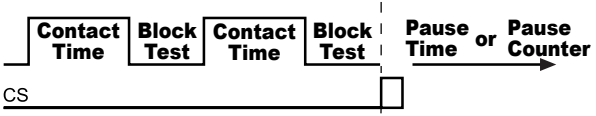
Signal from cycle switch during 1st block interval ⟶ **block operation is aborted** Pause interval is continued up to end of the regular preset pause time



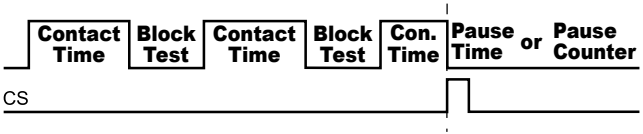

Signal from cycle switch during 2nd pump running time ⟶ **block operation is aborted** Regular preset pause time begins




Signal from cycle switch during 2nd block interval ⟶ **block operation is aborted** Pause interval is continued up to end of regular preset pause time

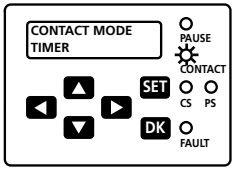



If a signal isreceived from the cycle switch during the 3nd pump running time ⟶ **block operation is aborted** Regular preset pause time begins



**No Signal from cycle switch**

Three pump running times and two block intervals without signal from cycle switch ⟶ **Block operation is abortted, a fault message is displayed!**




**Display on control panel**

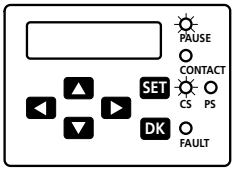
| Contact Time | Block Test | Contact Time | Block Test | Contact Time |
|---|---|---|---|---|

CS

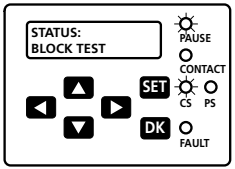
**!** Determine and rectify cause of fault

### 7.4 Block operation at display

Block operation with CS mode and PAUSE function

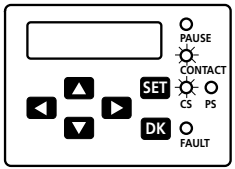



If system is in block operation pause time function with CS mode you will see alternately flasching of PAUSE LED and CS LED
PAUSE time function block test
Press key ▲ to activate display and show system status

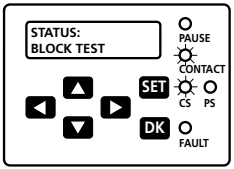



Display shows: BLOCK TEST

Block operation with CS mode and CONTACT function



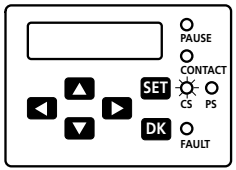

If system is in block operation contact time function with CS mode you will see alternately flasching of CONTACT LED and CS LED
CONTACT time function block test
Press key ▲ to activate display and show system status



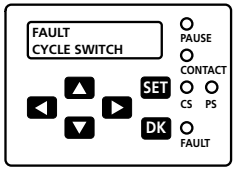

Display shows: BLOCK TEST

### 7.5 Fault indication CYCLE SWITCH at display

If a ”CS” fault massage is display ed LED FAULT flashes and will hear alternately a ”klick” noise




Press key ▲ to activate display and show system status




Display shows: FAULT CYCLE SWITCH

### 7.6 No signal from pressure switch

If PS (Pressure Switch) monitoring is programmed, normal operation will automatically stop when no signal from the pressure switch is received during the pump running. Fault message is displayed after block operation.

### 7.7 Storage of fault messages

The time that has elapsed since the occurrence of the fault message up to its acknowledgement will be added up and saved automatically. And the saved fault time is non erasable.
The maximum saveable fault time is 999999 hours and 59 min. And the minimum saveable fault interval is 1 min.

## 8. Technical Data

| | |
|---|---|
| Voltage of power supply | 12VDC min 9V to max18V<br>24VDC min 18V to max36V |
| Type of protection | IP20 |
| Max. Load output M | 5A |
| SL output (Signal Light) | 5W |
| Data storage | No limitation |
| Operating temperature | -25°C up to + 75 °C |
| Storage temperature | -40°C up to + 80°C |
| Fuse max: | 5A |
| Installation dimensions L x W x H | 137mm x 92mm x 42mm |
| Programmable contact time: | 1 s to 17h 59min 59s |
| Programmable pause time | 1 min to 999h 59min |
| Programmable impulses | 1 to 59999 |
| Operation hour Memory | 0 to 999999 h 59 min |
| Fault our Memory | 0 to 999999 h 59 min |
| Operating temperature without display function | -40°C up to +80°C |

## 9. Service Address